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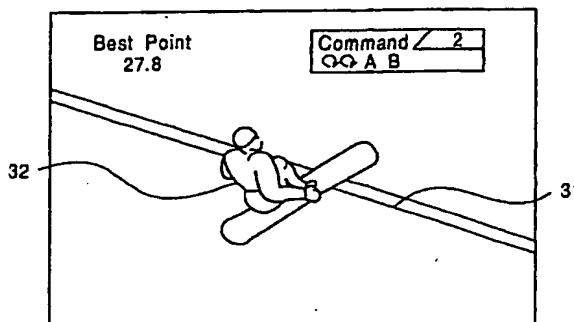
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(54) **Video game machine, action scoring method in video game, and recording medium on which action scoring program is recorded**

(57) In a video game machine, a character's action is scored according to whether or not a game player operates an operation unit at a suitable timing. An action selecting control function 62 urges the game player to select an action. A command specifying control function 63 specifies a command representing a combination of operations to be performed by the game player when a competitor reaches a predetermined distance from a course lip of a half-pipe course and causes a display unit to display the specified combination of operations corresponding to the selected action. A command input determining function 64 determines whether the specified command has been input before the competitor reaches the course lip. An action conducting control function 65 causes the competitor to conduct the selected action when the specified command is input. A scoring control function 66 scores the competitor's action in view of five performance elements.

FIG. 3



to operate the operation means at a correct timing or an incorrect timing, thereby making the game more enjoyable and entertaining.

[0010] In the aforementioned video game machine, the determining means may further detect a position of the character upon completion of the operations corresponding to the informed combination, and the scoring control means may perform scoring in accordance with the detected position relative to the predetermined action position.

[0011] The aforementioned video game machine may further include reference storage means for storing a reference operation time preset for the operation performed on each of the plurality of operation means. The determining means may further count an operation time required for the operations corresponding to the informed combination, and the scoring control means may perform scoring by using the reference operation time preset for the operations performed on the operation means included in the informed combination and by using the counted operation time.

[0012] With this arrangement, scores are variable in accordance with the time required from the start point to the end point of the operations, thereby enhancing the competitive atmosphere of the game.

[0013] Scoring may be performed by using the total reference operation time and the total operation time required for the entire operations. Alternatively, scoring may be performed by using the reference operation time for each of the operation means and the operation time required for the operation each of the operation means.

[0014] In the aforementioned video game machine, the determining means may count a loss time incurred between consecutive operations performed on the operation means included in the informed combination, and the scoring control means may perform scoring by using the reference operation time preset for the operation on the operation means included in the informed combination and by using the counted loss time.

[0015] With this arrangement, scores are variable according to whether the game player is able to operate the operation means quickly, thereby enhancing the competitive atmosphere of the game.

[0016] The aforementioned video game machine may further include point storage means for storing a point preset for the operation performed on each of the plurality of operation means. The scoring control means may perform scoring by adding the points preset for the operations performed on the operation means included in the informed combination.

[0017] With this arrangement, different points are stored according to the levels of difficulty in performing the operation means. Accordingly, scores are also variable according to the levels of difficulty in performing the operation means, thereby providing a video game having different levels of difficulty and a wide range of choice of actions.

[0018] In the aforementioned video game machine,

the selection control means may control selection of a plurality of actions from among the various actions in correspondence with the order of actions. The informing means may inform, in accordance with the order of actions, the operations included in the informed combination corresponding to each of the selected actions. The determining means may make the above determination on each of the selected actions. The scoring control means may add the scoring results of the respective selected actions and outputs the totaled result.

[0019] With this arrangement, the game player is able to feel as if he/she performed various actions in the actual half-pipe competition, thereby making the game more enjoyable and entertaining.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

Fig. 1 is a block diagram illustrating a game system according to an embodiment of the present invention;

Figs. 2 through 5 illustrate examples of a game screen;

Fig. 6 is a block diagram illustrating functions of a CPU, a stick-type controller, and the individual buttons;

Fig. 7 is a schematic view of the half-pipe course illustrating a scoring method; and

Fig. 8 is a flow chart illustrating a process of the scoring method.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] Referring to the block diagram illustrating an embodiment of the present invention shown in Fig. 1, a game system generally indicated by 1 is formed of a game machine unit, a television monitor 2 for outputting game images, an amplifying circuit 3 and a speaker 4 for outputting game sound, and a recording medium 5 on which game data including images, sound and program data is recorded. The recording medium 5 may be an optical disc, a flexible disk, or a ROM cassette in which a ROM storing, for example, the above game data and program data, such as an operating system, is accommodated within a plastic casing.

[0022] More specifically, the game machine unit is configured in the following manner. A bus 7 integrating an address bus, a data bus, and a control bus, is connected to a CPU 6. Connected to the bus 7 are a random access memory (RAM) 8, an interface circuit 9, an interface circuit 10, a signal processor 11, an image processor 12, an interface circuit 13, and an interface circuit 14. A controller 16 is connected to the interface circuit 10 via an operating information interface circuit 15. Digital-to-analog (D/A) converters 17 and 18 are connected to the interface circuits 13 and 14, respectively.

[0039] An example of the screen of this game system 1 is described hereinbelow with reference to Figs. 2 through 5.

[0040] Fig. 2 illustrates the screen displayed when an action is to be selected. Displayed on the upper portion of the screen is an action list consisting of action numbers from 1 to 30 to be selected by scrolling. One shot of the action selected by the cursor, in this example, action number 13, is shown on the lower left portion, and the action numbers which have already been selected are indicated on the lower right portion in chronological order. Eight actions can be selected in total, as shown in Fig. 2, and five actions have been selected so far.

[0041] Fig. 3 illustrates the screen after the half-pipe action has been started and also illustrates the state immediately before a competitor 32 jumps from a course lip (action position) 31. The best point obtained so far is shown on the upper left portion of the screen, and the order of action and a combination (command) of operation keys to be operated are indicated on the upper right portion.

[0042] Fig. 4 illustrates the screen while the competitor 32 is conducting an action after jumping from the course lip 31. The command shown on the upper right portion of the screen has been erased when the competitor 32 was off the course lip 31.

[0043] Fig. 5 illustrates the screen when all the actions have been completed. The scoring results (points) are indicated in the columns from J1 through J5 on the lower left portion of the screen, and the point total is shown on the lower right portion as TOTAL.

[0044] Fig. 6 is a block diagram illustrating the functions of the CPU 6, the RAM 8, the stick-type controller 16e, the cross key 16d, and the individual buttons 16b, 16c, 16h, 16i, 16j, and 16k. For simplified representation, the interface circuit 10, the operating information interface circuit 15, and the bus 7 are not shown.

[0045] Stored in the recording medium 5 are a predetermined number of combinations of the operation keys of the controller 16, i.e., the stick-type controller 16e and the individual buttons 16b, 16c, 16h, 16i, 16j, and 16k, corresponding to the various actions conducted in half-pipe competition.

[0046] For example, action number 16 "McTWIST" shown on the action selecting screen in Fig. 2 has a combination of four operations, such as "moving the stick-type controller 16e around a full circle clockwise", "moving the stick-type controller 16e around a full circle clockwise again", "pressing the A button 16b", and "pressing the B button 16c".

[0047] As a total, for example, 30 actions are set by using 30 combinations of the seven operation keys. The difficulty of operation is varied according to the number of operation keys or whether or not the stick-type controller 16e is used.

[0048] The CPU 6 includes, as illustrated in Fig. 6, a controller's operation detecting function 61, an action

selecting control function 62, a command specifying control function 63, a command input determining function 64, an action conducting control function 65, and a scoring control function 66.

[0049] The controller's operation detecting function 61 determines the one/off operations of the individual buttons 16b, 16c, 16h, 16i, 16j, and 16k and also detects the values of the X- and Y- coordinates corresponding to the tilting direction and the tilting angle of the stick provided for the stick-type controller 16e.

[0050] The action selecting control function 62 causes the display unit to display the action selecting screen illustrated in Fig. 2 and urges the game player to select the action before the competition is started. The action can be selected by moving the cursor by shifting the cross key 16d in the upward and downward direction and by further scrolling the action list in the upward and downward direction. The action designated by the cursor is then determined by pressing the A button 16b. The selected action can be canceled by pressing the B button 16c. When all the actions have been selected, the A button 16b is activated to erase the display of the action selecting screen, and the process is shifted to start the competition.

[0051] The command specifying control function 63 specifies a command representing a combination of operations to be performed by the game player and indicates the command corresponding to the selected action, as indicated on the upper right portion of the screen in Fig. 3. By using this command, the competitor 32, who has snowboarded the course and has reached a predetermined distance from the course lip 31, conducts an action at the course lip 31.

[0052] For example, as noted above, in Fig. 3, a combination of four operations, such as "moving the stick-type controller 16e around a full circle clockwise", "moving the stick-type controller 16e around a full circle clockwise again", "pressing the A button 16b", and "pressing the B button 16c", corresponding to action number 16 selected as the second action is shown.

[0053] The command input determining function 64 determines whether the designated command has been input before the competitor 32 has reached the course lip 31 (Fig. 3). The action conducting control function 65 controls the competitor 32 displayed on the screen to conduct the selected action if the command has been input.

[0054] The scoring control function 66 scores the action conducted by the competitor 32 in view of the following five elements.

1. Adding the points preset for the techniques that do not include rotation and performs calculation to obtain the average of the added points after all the technique actions have been completed. For example, two points are set for the input operation on each of the buttons 16b, 16c, 16h, 16i, 16j, and 16k, and every time each button is pressed, two points

[0061] Conversely, if it is found in step ST140 that the command has not been input before the competitor 32 has reached the course lip 31, as illustrated in Fig. 3, the scoring result is stored in the RAM 8 as zero points in step ST160.

[0062] Subsequently, it is checked in step ST170 whether all the eight actions have been completed. If the result of step ST170 is no, the process returns to step ST130, and the processing in step ST130 and the following steps is repeated. When all the actions have been completed in step ST170, the scoring result is indicated, as shown in Fig. 5, in step ST180, and the process is ended.

[0063] As discussed above, according to the foregoing embodiment, a combination of operation keys, i.e., a command, is indicated on the screen. It is then determined whether the command has been input, and scoring is performed according to whether or not the command has been input at a suitable timing. Thus, the scoring result is variable according to whether the command has been input at a correct timing or an incorrect timing, thereby making the video game more enjoyable and entertaining.

[0064] Additionally, the game player is required to input various commands, thereby enhancing the competitive atmosphere of the video game. The content of the command is not shown on the action selecting screen, but is disclosed immediately before the action is started. The game player is thus required to understand the content of the command quickly, thereby enhancing the competitive atmosphere of the video game.

[0065] The present invention is not restricted to the foregoing embodiment, and the following modifications (1) through (3) may be possible.

(1) In the above-described embodiment, half-pipe is performed in the game system 1. However, any type of video game may be performed, for example, figure skating or aerial stunts, as long as a moving character displayed on a display unit conducts an action at a predetermined position in correspondence with a combination of operation keys.

(2) The scoring control function 66 may use the following method in place of scoring method 5. The loss times incurred between consecutive operations on the operation keys for inputting the command may be considered in scoring. The ratio of the total reference operation time to the total loss time may be multiplied by full marks, for example, five points.

For example, in action number 16, it may be determined that the end point of the operation "moving the stick-type controller 16e around a full circle clockwise" is t11; the start point and the end point of the subsequent operation "moving the stick-type controller 16e around a full circle clockwise" are t12 and t13, respectively; the start time and the end time of the operation "pressing the A

button 16b" are t14 and t15, respectively; and the start time of the operation "pressing the B button 16c" is t16. The individual loss times are $t12 - t11 = 15$, $t14 - t13 = 25$, $t16 - t15 = 5$ (frames). Accordingly, the above-described ratio is calculated as follows.

$$(14 + 14 + 5 + 5) / (15 + 25 + 5) \times 5 = 4.2 \quad (2)$$

In this modification, the points are also added every time the action is conducted, and the average of the added points is obtained after all the actions have been completed.

(3) The method of scoring the actions by the scoring control function 66 is not restricted to the above methods, and various methods may be considered. For example, in the scoring method 4 of the foregoing embodiment, the total operation time required for inputting the command is compared with the total reference operation time. Instead, the time required for the operation performed on each operation key may be compared with the corresponding reference operation time.

[0066] Additionally, in the foregoing embodiment, the different reference operation times are set according to the levels of difficulty in operating the corresponding operation keys. However, all the reference operation times may be set to be uniform regardless of the operation key, and the coefficients may be set according to the levels of difficulty in operating the operation keys. Then, the ratio of the reference operation time to the time required for operating the corresponding operation key may be multiplied by the corresponding coefficient.

[0067] As described above, according to the video game machine of the present invention, a moving character displayed on a display unit conducts various actions at a predetermined action position in a game space. A combination of operations to be performed on a plurality of operation keys corresponding to the action selected from a plurality of actions is informed. It is then determined whether the input operation corresponding to the informed combination has been performed after the information has been provided and before the character reaches a predetermined action position. If the above input operation has been performed in time, an instruction is provided to cause the character to conduct the corresponding action. The action is then scored according to the results judged by the judging function. With this arrangement, the point total is variable according to whether the game player operates the operation keys at a correct timing or an incorrect timing, thereby making the video game more enjoyable and entertaining.

[0068] The character's position determined upon completing the input operation corresponding to the informed combination is detected, and scoring is performed in accordance with the detected position relative

means for storing a point preset for the operation performed on each of said plurality of operation means,

wherein said scoring control means performs scoring by adding the points preset for the operations performed on said operation means included in the informed combination.

6. A video game machine according to claim 1, characterized in that said selection control means controls selection of a plurality of actions from among said various actions in correspondence with the order of actions, said informing means informs, in accordance with the order of actions, the operations included in the informed combination corresponding to each of the selected actions, said determining means makes said determination on each of the selected actions, and said scoring control means adds the scoring results of the respective selected actions and outputs the totaled result.
7. An action scoring method for use in a video game in which a moving character displayed on display means conducts various actions at a predetermined action position in a game space, said method being characterized by comprising the steps of:

informing a combination of operations to be performed on a plurality of operation means corresponding to an action selected from among said various actions;

determining whether the operations corresponding to the informed combination have been performed after the information has been provided in said informing step and before said character reaches the predetermined action position;

causing said character to conduct the action in a case where the operations corresponding to the informed combination have been performed; and

scoring the action by using a result determined by said determining means.

8. A recording medium for recording an action scoring program for use in a video game in which a moving character displayed on display means conducts various actions at a predetermined action position in a game space, said action scoring program being characterized by comprising:

an informing step of informing a combination of operations to be performed on a plurality of operation means corresponding to an action selected from among said various actions;

a determining step of determining whether the operations corresponding to the informed com-

bination have been performed after the information has been provided in said informing step and before said character reaches the predetermined action position;

an action conducting step of causing said character to conduct the action in a case where the operations corresponding to the informed combination have been performed; and

a scoring step of scoring the action by using a result determined by said determining means.

FIG. 2

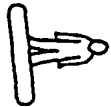
SELECT TRICK

▶ 13 / ALLEY OOP

▶ 14 / 540

▶ 15 / 720

▶ 16 / Mc TWIST



1 ▶ 9 5 ▶ 22

2 ▶ 16 6 ▶

3 ▶ 19 7 ▶

4 ▶ 21 8 ▶

CANCEL --- B

FIG. 3

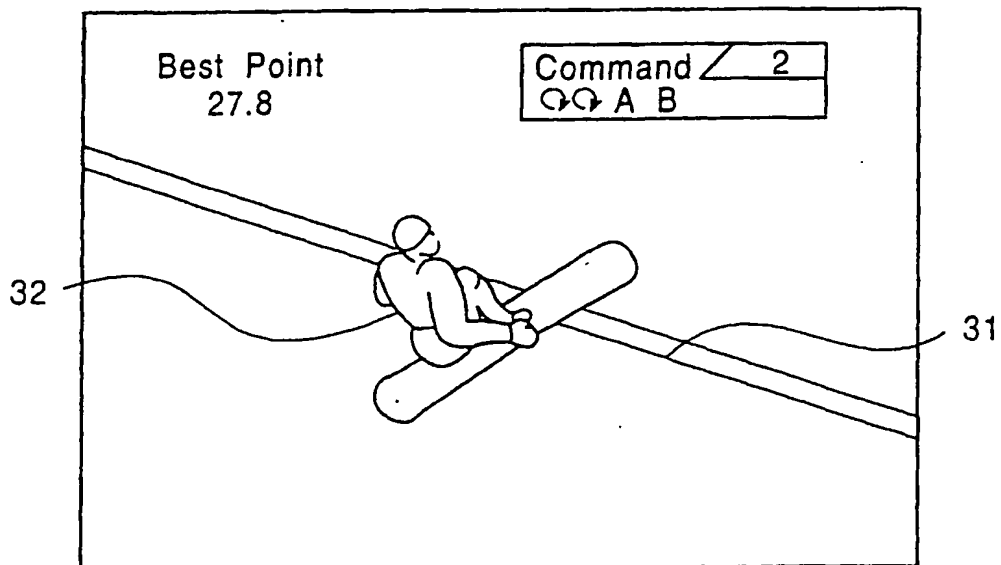


FIG. 6

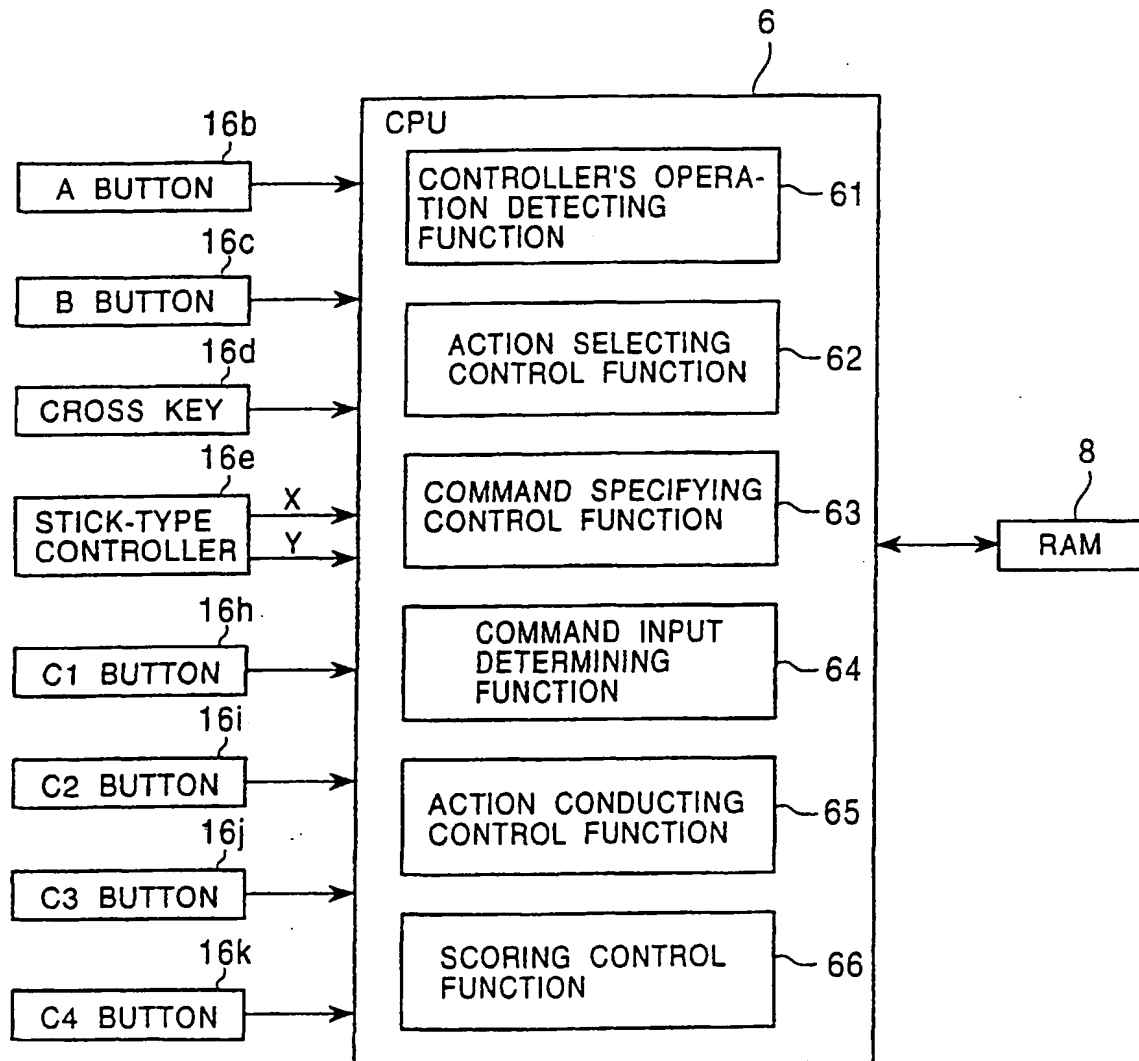


FIG. 8

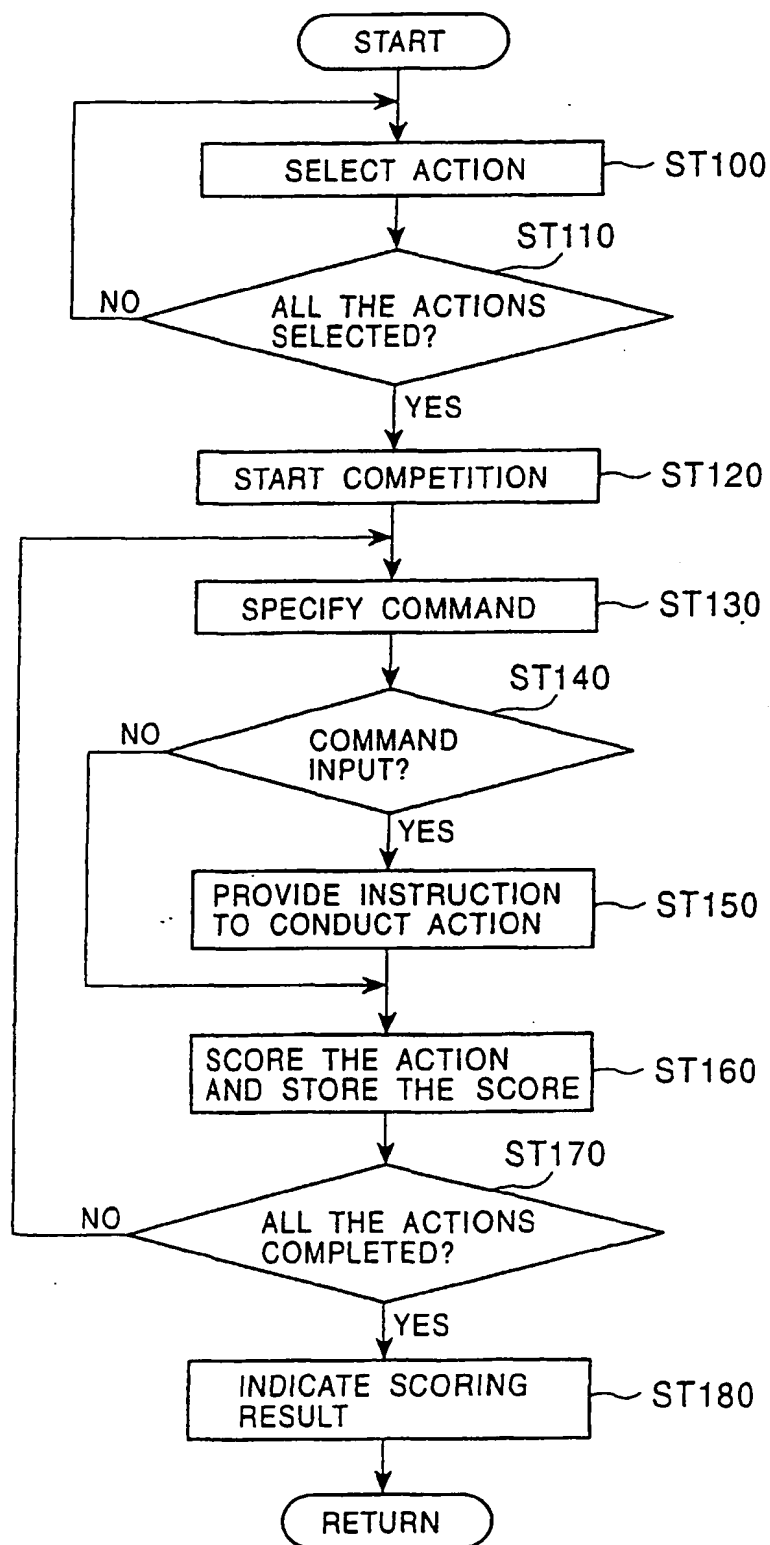


FIG. 1

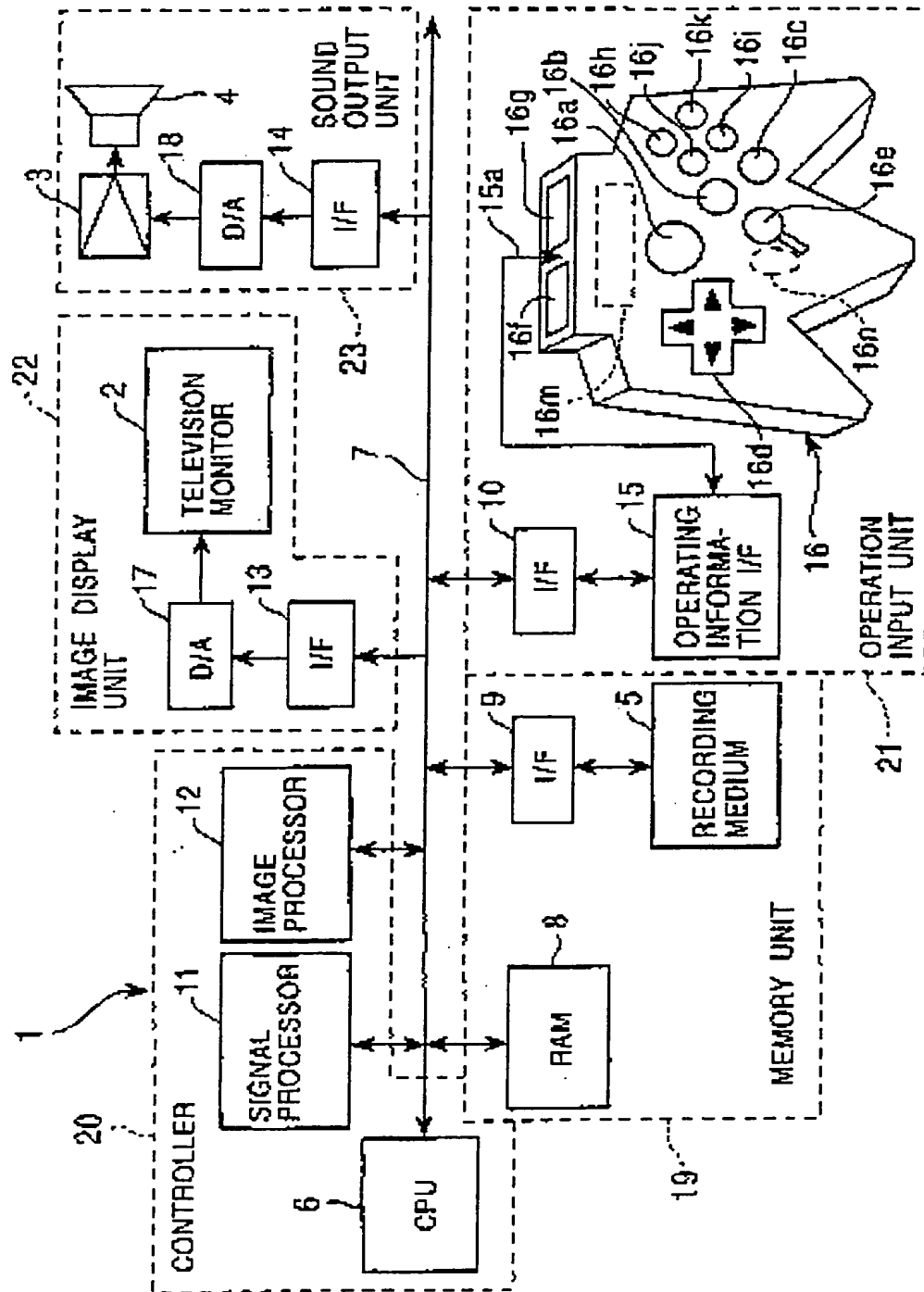


FIG. 4

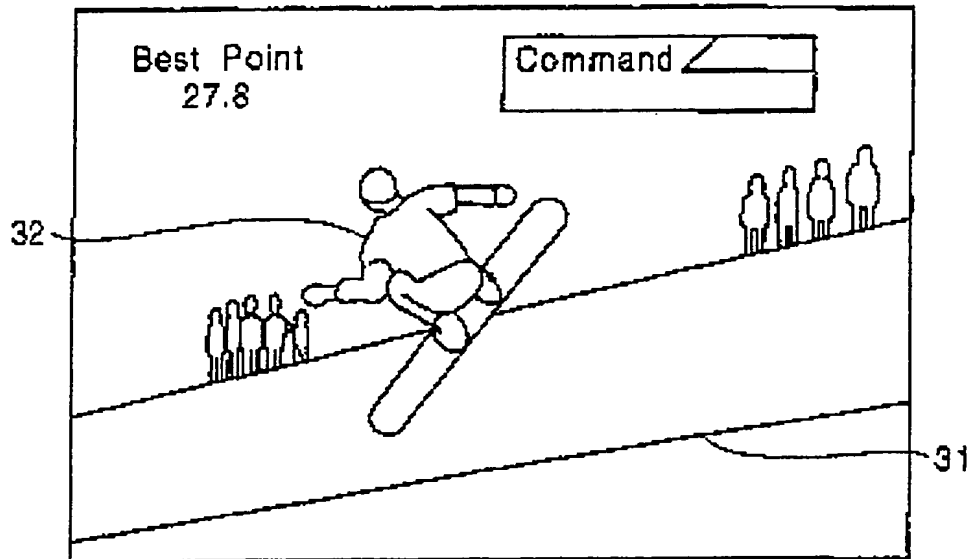


FIG. 5

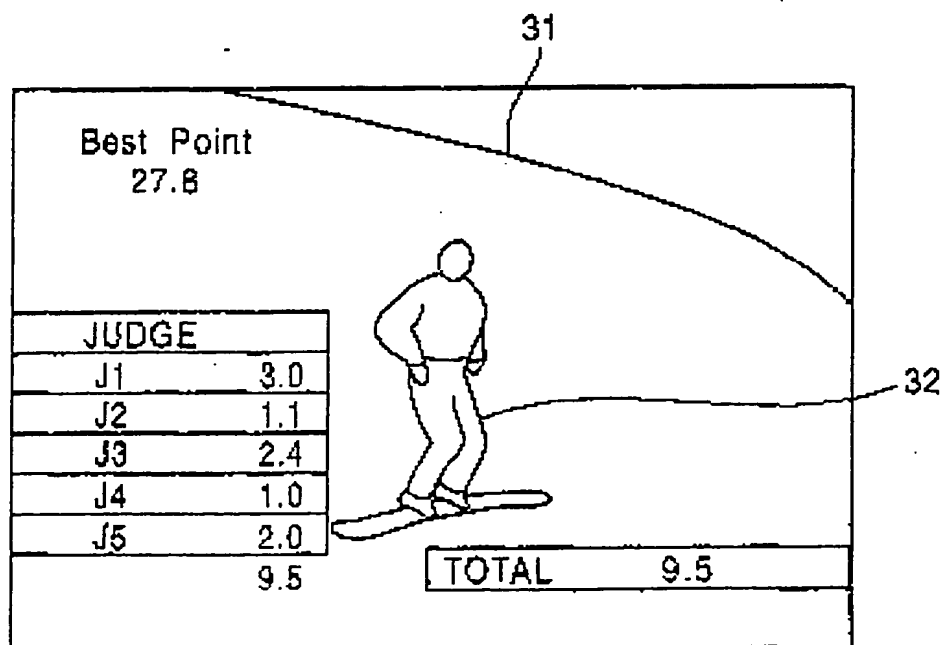
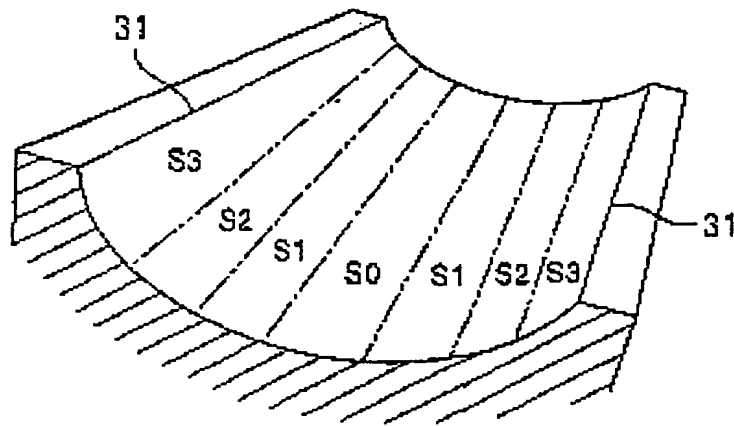


FIG. 7



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(30) Priority: 20.11.1997 JP 32019597

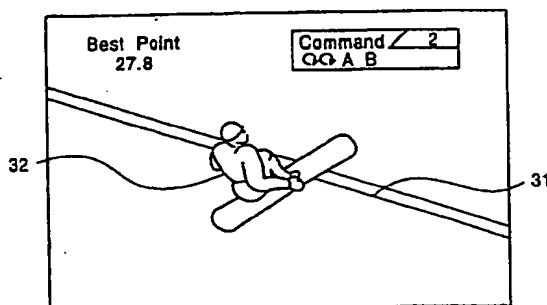
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FIG. 3



**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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21-02-2001

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